



Estudo Longitudinal de Saúde do Adulto

ELSA BRASIL



ULTRA-PROCESSED FOODS, INCIDENT OVERWEIGHT AND OBESITY, AND LONGITUDINAL CHANGES IN WEIGHT AND WAIST CIRCUMFERENCE– THE ELSA-BRASIL STUDY

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Introduction



- ▶ More direct evidence from longitudinal studies is scant.

Objective

Our aim is to evaluate the association of **ultra-processed food (UPF)** consumption with **large weight** and **waist gains**, and with **incident overweight/obesity** in the Longitudinal Study of Adult Health (ELSA-Brasil).

Methods

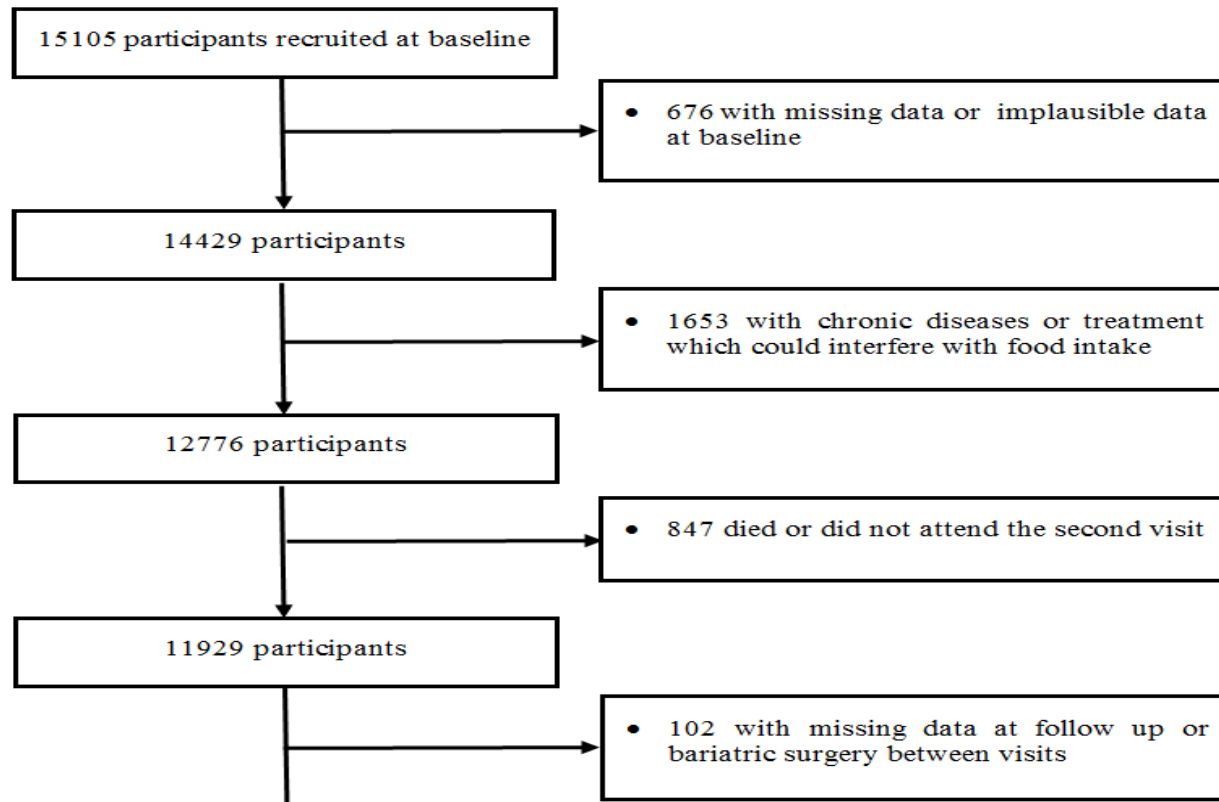


2008-2010

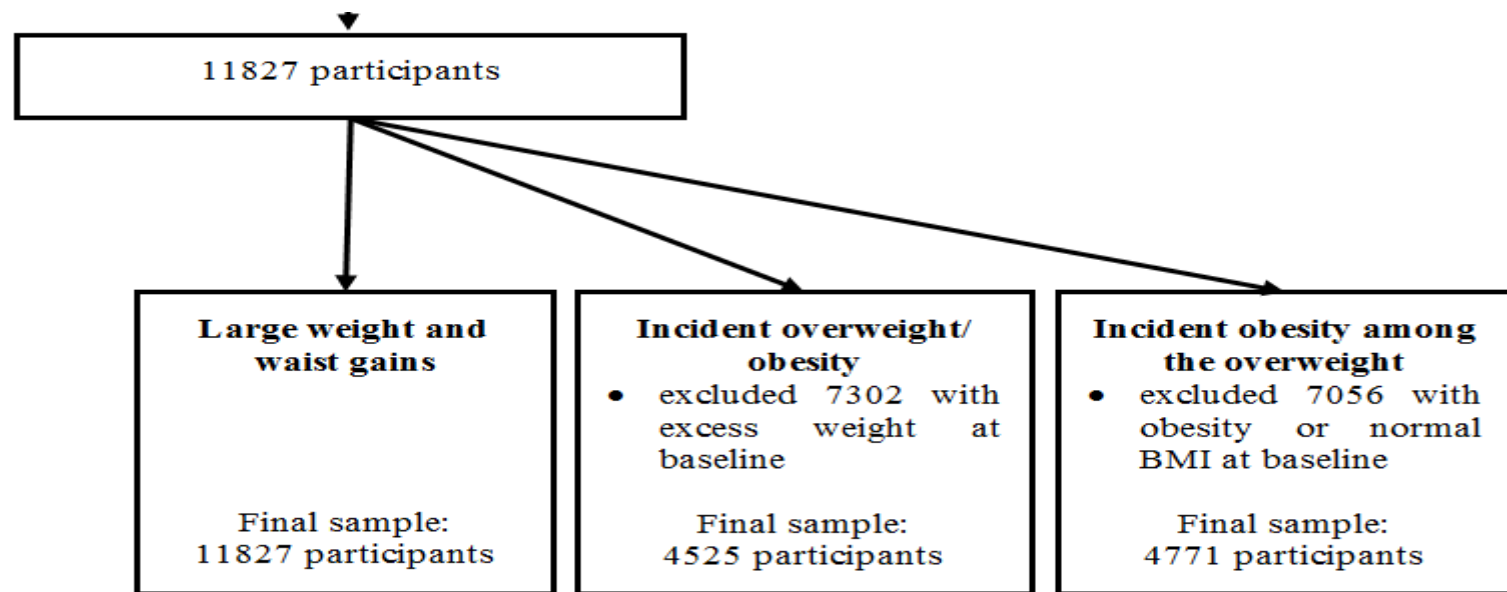
- ELSA-Brasil: a cohort study
 - 15.105 Brazilian civil servants
 - 35-74 years of age
 - in six capital cities
- Food consumption: 114 item food frequency questionnaire
- Height, weight and waist circumference measured

2012-2014

- Height, weight and waist circumference re-measured



Exclusion Diagram.



Exclusion Diagram.

Methods

Exposure

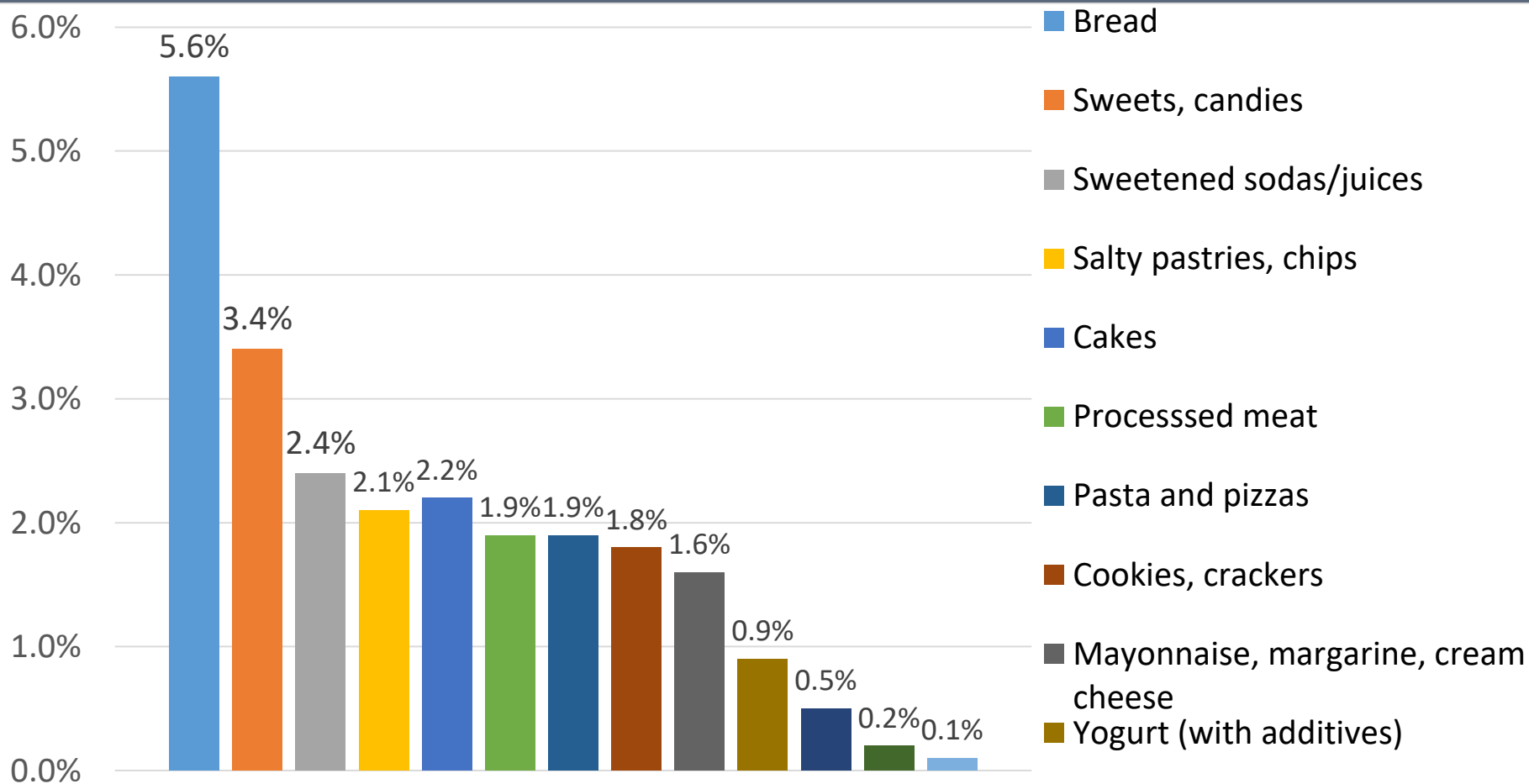
- Consumption of **ultra-processed foods** \Rightarrow NOVA classification
- Analyzed as:
 - a continuous variable (15% increase in total energy value consumed);
 - a categorized variable (quartiles).
- **Poisson regression** to adjust for covariates

Methods

Outcomes

- Weight/waist gains: difference between the baseline and follow-up
- Annual gains: divided by the time between visits
- Large weight gain \geq 90th percentile
- Large waist circumference gain \geq 90th percentile
- Incident overweight/obesity: BMI \geq 25kg/m²
- Incident obesity among those overweight: BMI \geq 30kg/m²

Results



Frequency of consumption (% of total energy intake) of specific ultra-processed foods and beverages. ELSA-Brasil, 2008-10 (n=11827).

Characteristics*of the study sample according to quartiles of ultra-processed food consumption, ELSA-Brasil, n=11.827.

Characteristic	Ultra-processed Food Consumption (% of total daily energy intake)				Total
	Quartile 1 (0%-17.79%)	Quartile 2 (17.79%-23.91%)	Quartile 3 (23.91%-30.84%)	Quartile 4 (30.84%-73.84%)	
	N=2852	N=2969	N=2990	N=2976	N=11827
Age (years)	53.6 (8.5)	51.7 (8.6)	50.7 (8.5)	49.3 (8.7)	51.3 (8.7)
Sex (%)					
Feminine	1350 (46.7)	1576 (53.1)	1716 (57.4)	1865 (62.7)	6507 (55.0)
Skin color/race (%)					
Black	628 (21.7)	504 (17.0)	440 (14.7)	341 (11.5)	1913 (16.2)
Brown	972 (33.6)	902 (30.4)	789 (26.4)	658 (22.1)	3321 (28.1)
White	1174 (40.6)	1453 (48.9)	1652 (55.2)	1890 (63.5)	6169 (52.2)
Asian	75 (2.6)	86 (2.9)	76 (2.5)	66 (2.2)	303 (2.6)
Indigenous	43 (1.5)	24 (0.8)	33 (1.1)	21 (0.7)	121 (1.0)
Per capita family income (minimal wages/ month)	5 (3-8)	5 (3-9)	6 (4-10)	6 (4-9)	5 (3-9)

Expressed as mean (SD), median (25th and 75th percentile) or frequency (%).

TABLE 1

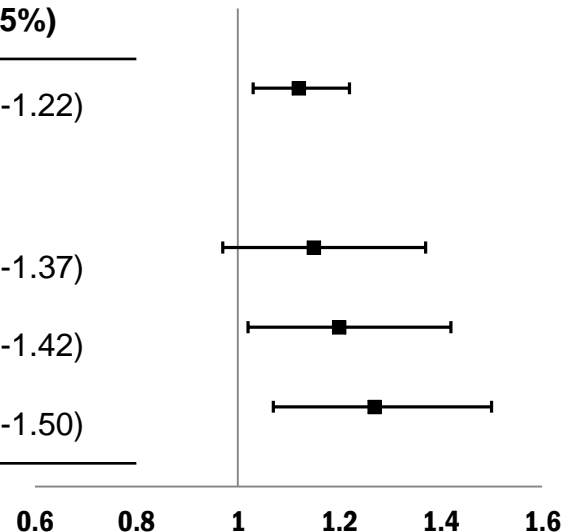
Characteristics*of the study sample according to quartiles of ultra-processed food consumption, ELSA-Brasil, n=11.827.

Characteristic	Ultra-processed Food Consumption (% of total daily energy intake)				Total
	Quartile 1	Quartile 2	Quartile 3	Quartile 4	
	(0%-17-79%) N=2852	(17-79%-23-91%) N=2969	(23-91%-30-84%) N=2990	(30-84%-73-84%) N=2976	
School achievement (%)					
Less than elementary	264 (9-1)	131 (4-4)	113 (3-8)	80 (2-7)	588 (5)
Elementary	250 (8-6)	211 (7-1)	142 (4-7)	136 (4-6)	739 (6-2)
Secondary	1126 (38-9)	1056 (35-6)	1009 (33-7)	921 (30-9)	4112 (34-8)
College/university	1252 (43-3)	1571 (52-9)	1726 (57-7)	1839 (61-8)	6388 (54)
Smoking (%)					
Never	1586 (54-8)	1696 (57-1)	1779 (59-5)	1866 (62-7)	6927 (58-6)
Ex-smoker	902 (31-2)	886 (29-8)	857 (28-7)	764 (25-7)	3409 (28-8)
Current	404 (14-0)	387 (13-0)	354 (11-8)	346 (11-6)	1491 (12-6)
Physical activity at leisure time (MET-min./week)	240 (0-960)	264 (0-960)	244 (0-954)	240 (0-929)	240 (0-960)
Body mass index (kg/m²)	26-8 (4-6)	26-8 (4-6)	26-8 (4-5)	26-8 (4-8)	26-8 (4-6)
Waist circumference (cm)	91.6 (12.4)	90.7 (12.2)	90.2 (12.5)	89.7 (12.7)	90.6 (12.5)
Total daily energy intake (kcal/day)	2582 (917)	2624 (931)	2635 (940)	2654 (946)	2624 (934)

Expressed as mean (SD), median (25th and 75th percentile) or frequency (%).

Risk of large weight gain (> 90th percentile: 1.68 kg/year),
ELSA-Brasil (n=11827).

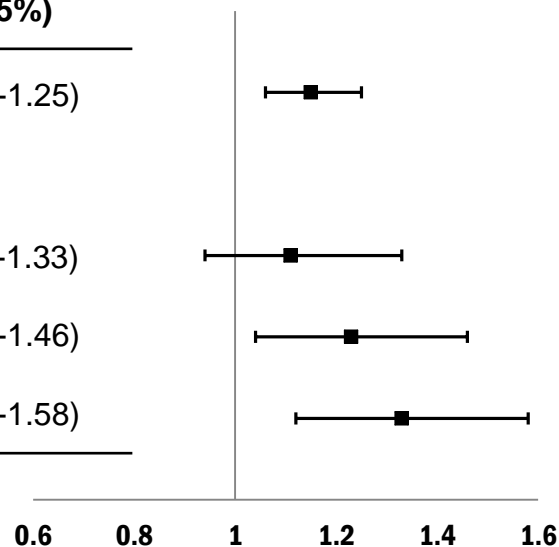
	Crude	Adjusted*
	RR (IC95%)	RR (IC95%)
For each 15% point increase	1.36 (1.26-1.47)	1.12 (1.03-1.22)
Q1	1	1
Q2	1.35 (1.14-1.61)	1.15 (0.97-1.37)
Q3	1.51 (1.28-1.78)	1.20 (1.02-1.42)
Q4	1.79 (1.52-2.10)	1.27 (1.07-1.50)



*Through Poisson regression with robust variance for: age, sex, color/race, center, school achievement, smoking, physical activity, baseline BMI.

Risk of **large waist circumference gain (> 90th percentile: 2.42 cm/year)**,
ELSA-Brasil (n=11827).

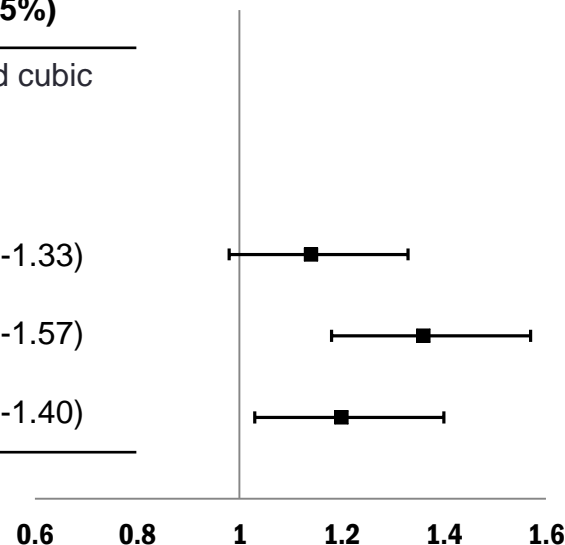
	Crude	Adjusted
	RR (IC95%)	RR (IC95%)
For each 15% point increase	1.42 (1.31-1.53)	1.15 (1.06-1.25)
Q1	1	1
Q2	1.29 (1.08-1.54)	1.11 (0.94-1.33)
Q3	1.56 (1.32-1.84)	1.23 (1.04-1.46)
Q4	1.92 (1.64-2.26)	1.33 (1.12-1.58)



*Through Poisson regression with robust variance for: age, sex, color/race, center, school achievement, smoking, physical activity, and waist circumference at baseline.

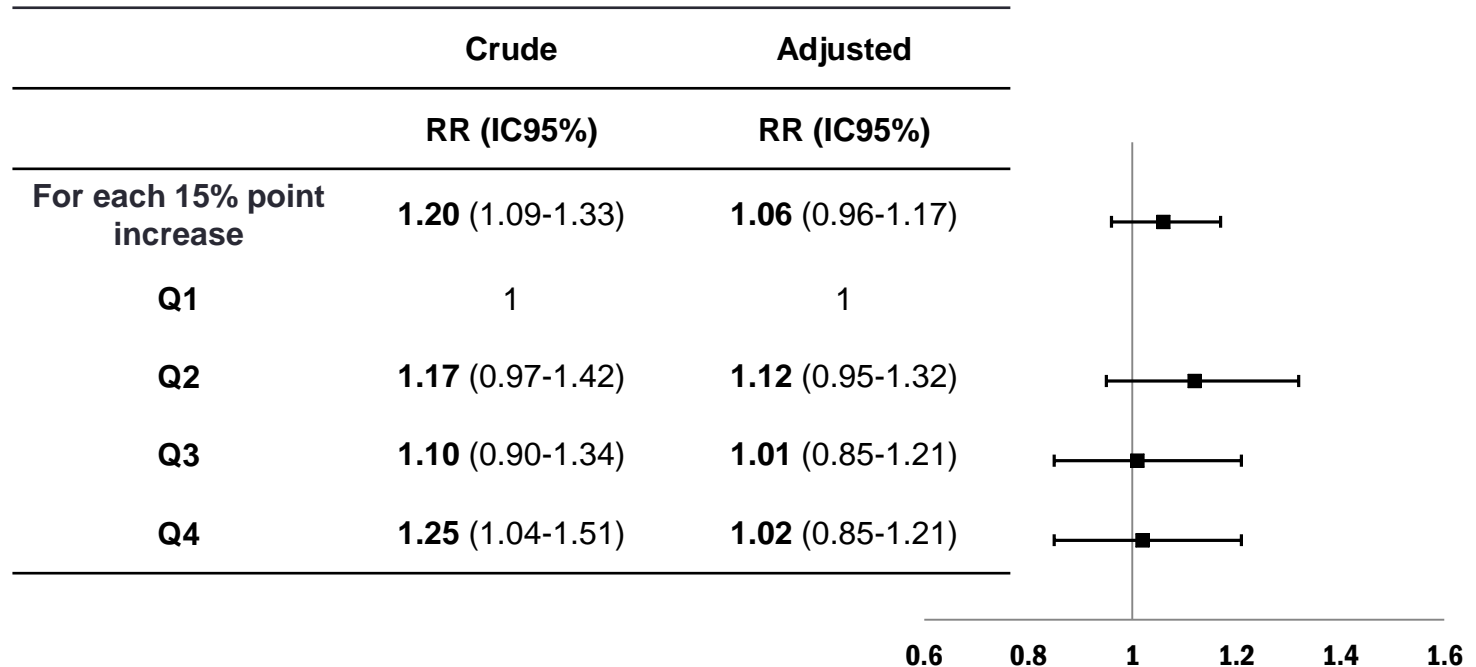
Risk of incident overweight and obesity (body mass index ≥ 25 kg/m²), ELSA-Brasil (n=4527).

	Crude	Adjusted
	RR (IC95%)	RR (IC95%)
For each 15% point increase	(non-linear association in restricted cubic spline regression)	
Q1	1	1
Q2	1.19 (1.00-1.41)	1.14 (0.98-1.33)
Q3	1.37 (1.16-1.61)	1.36 (1.18-1.57)
Q4	1.31 (1.11-1.54)	1.20 (1.03-1.40)



*Through Poisson regression with robust variance for: age, sex, color/race, center, school achievement, smoking, physical activity, baseline BMI.

Risk of incident obesity among those overweight at baseline (body mass index ≥ 30 kg/m²), ELSA-Brasil (n=4771).



*Through Poisson regression with robust variance for: age, sex, color/race, center, school achievement, smoking, physical activity, baseline BMI.

Conclusion

- Population attributable fraction
 - 15% of outcomes attributable to high consumption of UPF
- Greater UPF consumption predicts **large gains in overall and central adiposity** and may contribute to the unstoppable **rise in obesity** seen worldwide.

Acknowledgments



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ELSA BRASIL

**Secretaria de Ciência,
Tecnologia e Insumos Estratégicos**

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Apoio

